

HAWAII STATE DEPARTMENT OF HEALTH DISEASE OUTBREAK CONTROL DIVISION

2005-06 Influenza Season Summary

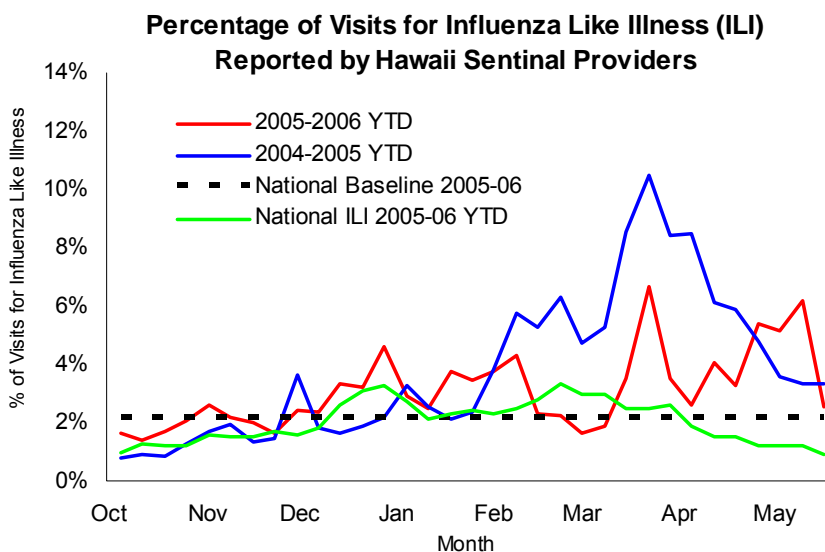
October 1, 2005 – May 20, 2006: MMWR¹ Week 40, 2005 – 20, 2006

Summary:

During the 2005-06 traditional flu season, which extends from MMWR week 40 (October 1, 2005) – week 20 (May 20, 2006) (total 33 weeks), influenza-like illness (ILI) activity in Hawaii occurred at low levels between October and January, steadily rose from January to March, and peaked during MMWR week 12 (the last week of March 2006). Flu-like activity decreased subsequently, although Hawaii experienced a second increase in activity with another peak during MMWR weeks 18-19 (mid May). Testing at the Hawaii State Laboratories Division (SLD) demonstrated that the predominant circulating strain was influenza A(H3N2), occurring almost exclusively between October and mid-February. The months of March and April saw a steady rise in influenza A(H1N1) and influenza B strains. Overall, the 2005-06 traditional flu season in Hawaii was relatively mild, whereas the 2004-05 season was moderate in intensity.

Influenza Like Illness (ILI):

The percentage of outpatient visits for ILI, as reported by Hawaii's sentinel physicians, exceeded the national baseline² for the majority of the flu season. Visits for ILI occurred at low levels (mean 2.6%) between October 2005 and the second week of January 2006. ILI visits then steadily increased between the third week of January and the end of March (mean 3.7%), peaking at 6.6%. A rapid decline to 2.6% over the course of two weeks was followed by another rise beginning in mid-April, which appeared to peak at 6.2% in mid-May, and then declined to 3.0% at the end of the 2005-06 flu season. Overall, visits for ILI reported during the past traditional flu season was lower than that reported during the previous (2004-05) season.



¹ MMWR stands for 'Morbidity and Mortality Weekly Report,' conventionally used by the Centers for Disease Control and Prevention (CDC). The weeks of a flu season are often referred to by their respective MMWR week. See appendix 1 for interpretation of MMWR weeks.

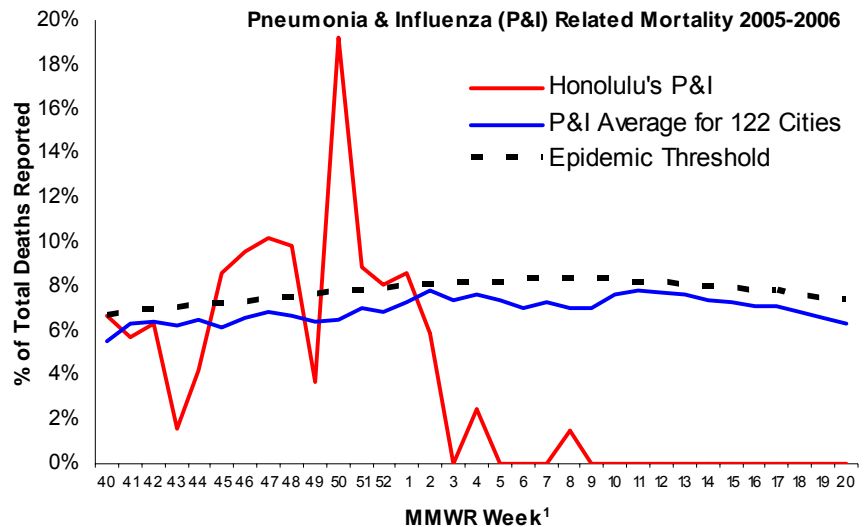
²The national and regional percentage of patient visits for ILI is weighted on the basis of state population. However, due to wide variability in regional level data, the CDC does not consider it appropriate to apply the national baseline to regional level data.

Pneumonia & Influenza Mortality:

The proportion of deaths in Honolulu caused by pneumonia and influenza (P&I)³ surpassed the epidemic threshold and national average for 122 cities in the early part of 2005-06 traditional flu season⁴ (mid November 2005 – beginning January, 2006). Since then, the mortality in Honolulu dropped well below the national average, averaging 0.5% for the remainder of the flu season.

No mortality due to influenza or pneumonia was recorded for 17 weeks of the 2005-06 traditional flu season.

Peak mortality occurred during the second week of December 2005, with 14 pneumonia-related deaths in Honolulu. Eighty-seven (3.9%) P&I related deaths (4 attributed to influenza) of 2,255 total deaths were recorded in Honolulu during the past flu season. None of these deaths occurred in pediatric populations. The number of P&I deaths during the 2005-06 flu season was significantly less than the number recorded during the previous (2004-05) flu season (228 deaths).

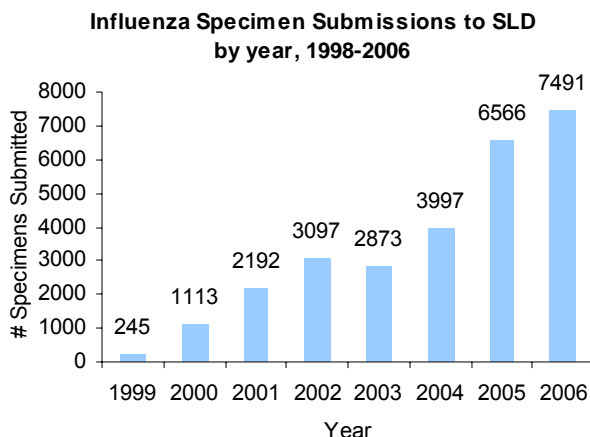


³ This data was reported by the Hawaii State Department of Health Vital Statistics Office.

⁴ National Data presented in this report is obtained from the CDC's Weekly Influenza Summary.

Laboratory Surveillance:

During the 2005-06 flu season, the Hawaii Department of Health (HDOH) experienced the highest influenza specimen submission rate ever recorded. A total of 7,491 specimens were submitted.



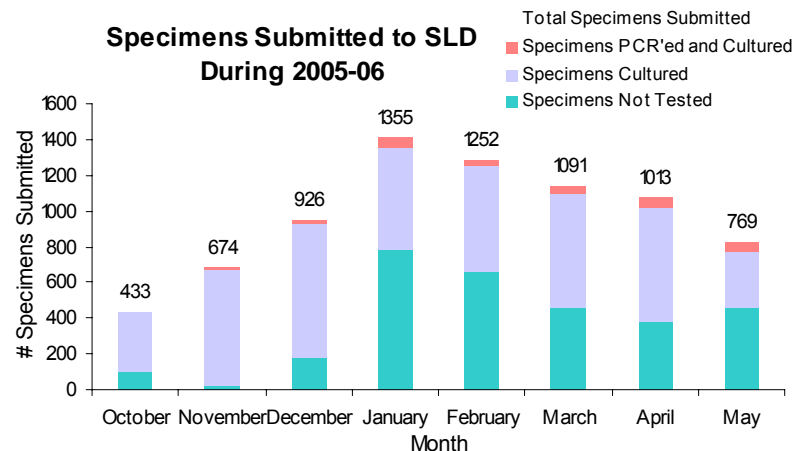
Specimen submissions have steadily increased over the last several years. To accommodate the high specimen volume, to reduce turnaround time, optimize data quality, and improve utilization of limited resources, the Disease Outbreak Control Division (DOCD) and SLD collaborated this season to develop criteria⁵ to prioritize specimens for testing.

Specimens that did not meet criteria for testing were archived; they will be stored until the next flu season in case more comprehensive analysis becomes necessary.

⁵Specimens from underrepresented populations, those positive for influenza by rapid antigen testing, and other urgent specimens (including those submitted by sentinel physicians, specimens related to suspected influenza outbreaks, airport surveillance specimens, and samples from very ill hospitalized patients or patients with a travel history to any international destination) were prioritized for testing.

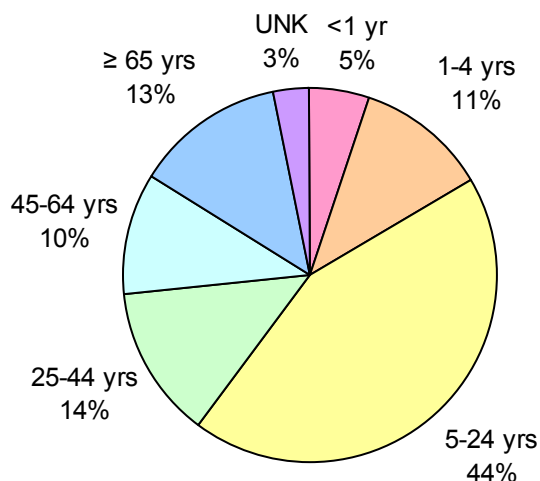
A total of 4,385 (mean 146 specimens/week) specimens meeting HDOH criteria were tested by SLD during the 2005-06 traditional flu season. Starting MMWR week 17, DOH lowered influenza testing from enhanced surveillance (30/day during the flu season) to routine surveillance (15/day during the summer). During the summer, SLD plans to test a mean of 78 specimens/week as part of the year-round influenza surveillance program.

HDOH introduced reverse transcriptase polymerase chain reaction (RT-PCR) testing in November 2005. Specimens identified as *urgent*⁵ were tested by RT-PCR. RT-PCR is a fast and reliable test for influenza, and results may be obtained in two hours. The introduction of RT-PCR is a major step toward strengthening Hawaii's capability to quickly identify circulating and new influenza strains.

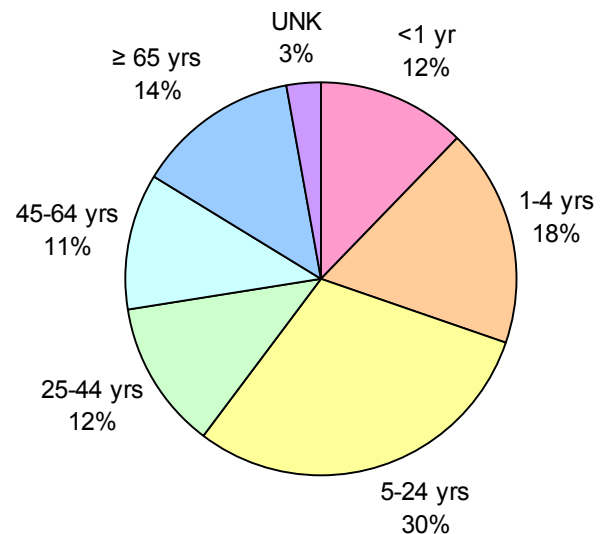


The pie charts below indicate the distribution of specimens tested and positive influenza cases in Hawaii by age group for the 2005-06 flu season. Based on this data, school children and young adults (age group 5-24) apparently were most likely to test positive when influenza was suspected (44% of positive influenza cases versus 30% of specimens tested), whereas infants (age group <1 year) were least likely to be positive for influenza and likely to have other etiologies for their respiratory illness (5% of positive influenza cases versus 12% of specimens tested).

2005-2006 Flu Season: Positive Influenza Cases by Age Group

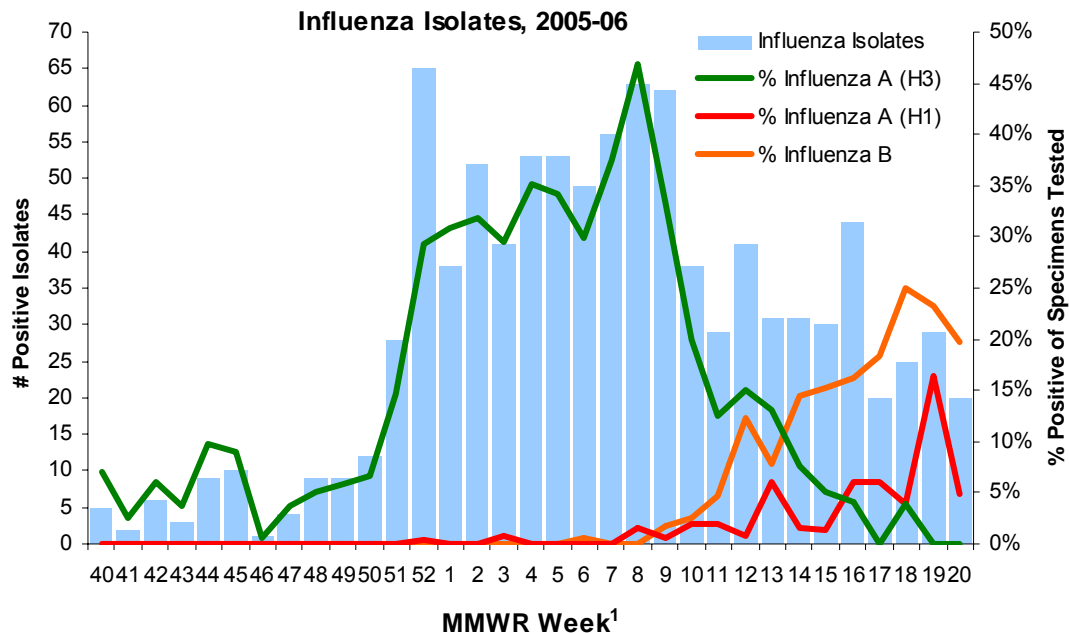


2005-2006 Flu Season: Specimens Tested by Age Group



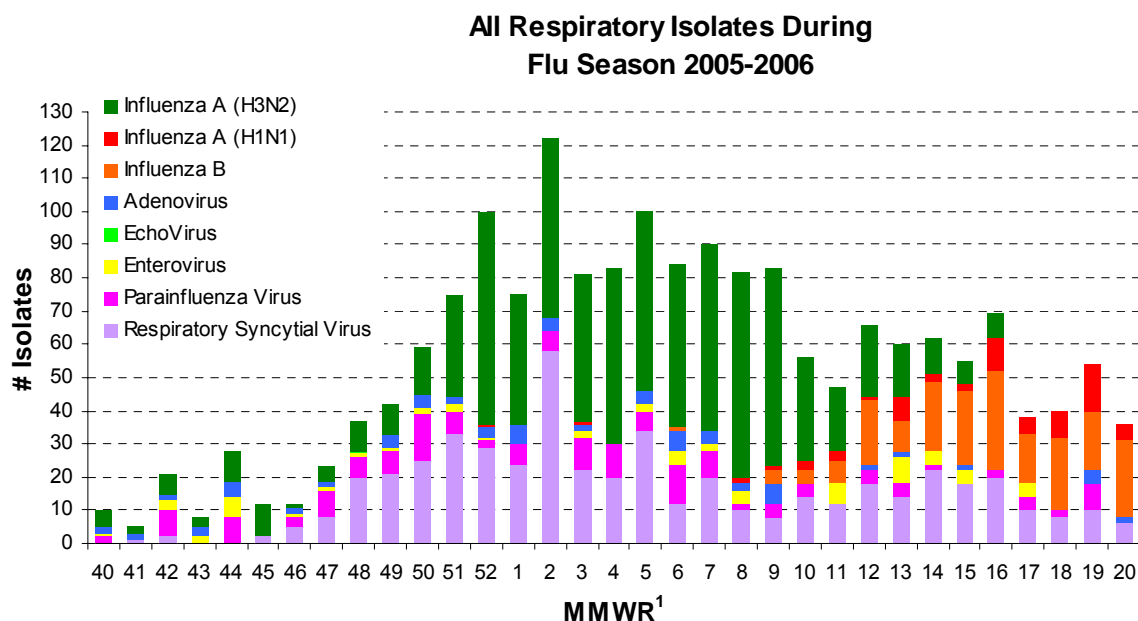
In Hawaii, the percentage of respiratory specimens positive for influenza viruses peaked at 49% during MMWR week 8 (week ending February 25, 2006). The exceptionally high isolation rates may be at least in part influenced by HDOH's recently developed specimen prioritization criteria.

The majority of specimens cultured by SLD during the past flu season (October, 2005 – mid March, 2006) tested positive for influenza A (H3N2); numbers of influenza A (H3) isolates declined from April 2006 onward. Beginning in March 2006, HDOH detected increasing numbers of influenza B and influenza A (H1) isolates, with influenza B detection peaking in May 2006.



* Data courtesy of State Laboratories Division

A total of 968 (22%) of 4,385 specimens tested by SLD were confirmed influenza positive during the recent flu season; 735 (76%) of these were influenza A(H3N2), and 57 (6%) were influenza A(H1N1). There were 176 (18%) influenza B cases. Select isolates were sent to the CDC for sub-typing confirmation. In addition to influenza, SLD screened specimens for other respiratory viruses. Data obtained from SLD and the Tripler Army Medical Center are presented in the graph below.



* Data courtesy of SLD and Tripler Army Medical Center, Honolulu, Hawaii.

Antigenic Characterization:

Isolate information for 48 specimens were received from the CDC. Thirty-nine (81%) were influenza A(H3N2) viruses. The principal circulating strains of H3N2 viruses in Hawaii were A/California/07/2004-like (56%), A/New York/55/2004-like (31%), and A/Wisconsin/67/2005-like (13%). A/California/07/2004 and A/New York/55/2004 are antigenically similar viruses; A/New York/55/2004 was used by most manufacturers for the production of the 2005-06 influenza vaccine. A/Wisconsin/67/2005 is an antigenic variant which evolved from A/California/07/2004, and is recommended to serve as the H3 component in the 2006-07 influenza vaccine.

All four (8%) influenza A(H1N1) viruses isolated were A/New Caledonia/20/99-like, which is the H1 component in the 2005-06 and 2006-07 flu vaccines. Four (8%) influenza B isolates were characterized as B/Ohio/01/2005-like, an influenza B virus from the B/Victoria lineage, and one (2%) as B/Florida/07/2004-like, an influenza B virus from the B/Yamagata lineage. B/Florida/07/2004 is a recent reference strain that is antigenically similar to the B component in the 2005-06 vaccine (B/Shanghai/361/2001-like viruses). B/Ohio/01/2005 is a recent reference strain of the B component in the 2006-07 flu vaccine (B/Malaysia/2506/2004-like viruses).

Airport Surveillance:

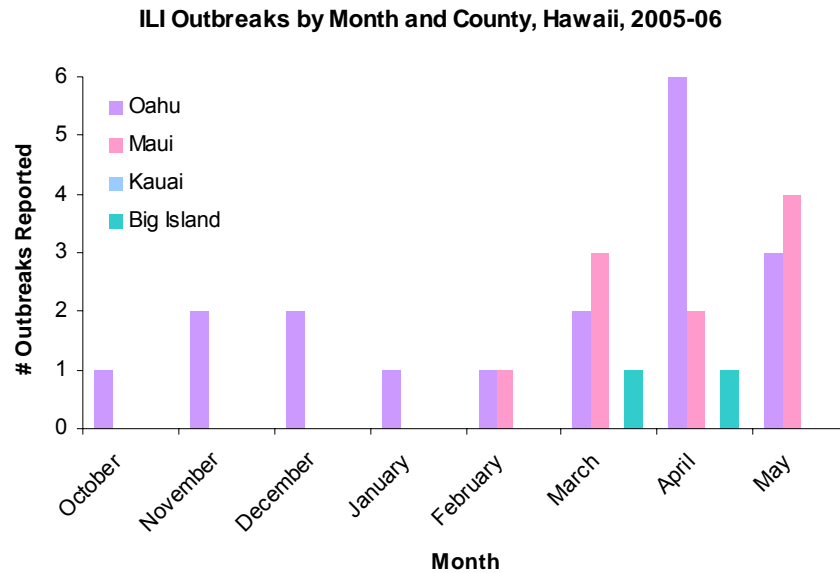
The HDOH introduced airport surveillance in collaboration with CDC's Quarantine Station at the Honolulu International Airport (HQS) and Queen's Hospital's Airport Medical Staff (QAMS) during the 2005-06 traditional flu season. Patients meeting clinical criteria⁶ were swabbed at the airport, and specimens were tested by RT-PCR and viral culture techniques at SLD. A total of 24 patients⁷ meeting clinical criteria for flu (none of whom met avian influenza criteria) were swabbed and tested. The majority (16 [67%]) of these patients were Japanese; 2 (8%), American; and 1 (4%), Samoan. The origins of 5 (21%) were unspecified. Patient ages ranged from 4 months-77 years, with a mean age of 18 years. An equal distribution of male and female passengers was swabbed. Influenza A was detected in 4 (17%) of 24 specimens tested; no others were positive for influenza.

⁶Clinical Criteria is define as a fever or history of fever of body temperature 100°F or greater, along with one or more of the following symptoms: headache, muscle aches, sore throat, cough, chills, malaise, and/or vomiting.

⁷Denominator data is currently unavailable. The collection of denominator data was not standardized in the past and mechanisms for quickly accessing existing data are not in place.

Clustered ILI Activity:

During the 2005-06 influenza season, HDOH received 30 reports of ILI outbreaks. Ten (33%) reports were from long term care facilities (LTC); all other reports were from schools. Specimens were collected for influenza testing from 17 institutions (8 LTC [80%] and 9 schools [53%]). The presence of influenza was excluded in three (10%) facilities and was confirmed through RT-PCR testing and viral culture isolation in 13 (43%) locations (10 influenza A and 3 influenza B).



Avian Influenza:

At the end of the 2005-06 traditional flu season, human cases of avian influenza A(H5N1) have been detected in 10 countries. A total of 224 cases have been confirmed by the World Health Organization (WHO). More than half (57%) the patients who became ill with avian influenza worldwide died; 127 deaths due to A(H5N1) infection have been reported to date.

Cumulative Number of Confirmed Human Cases of Avian Influenza A(H5N1)

| Country | 2003 | | 2004 | | 2005 | | 2006 | | Total | |
|--------------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|
| | cases | deaths | cases | deaths | cases | deaths | cases | deaths | cases | deaths |
| Azerbaijan | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 5 | 8 | 5 |
| Cambodia | 0 | 0 | 0 | 0 | 4 | 4 | 2 | 2 | 6 | 6 |
| China | 0 | 0 | 0 | 0 | 8 | 5 | 10 | 7 | 18 | 12 |
| Djibouti | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| Egypt | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 6 | 14 | 6 |
| Indonesia | 0 | 0 | 0 | 0 | 17 | 11 | 31 | 25 | 48 | 36 |
| Iraq | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 |
| Thailand | 0 | 0 | 17 | 12 | 5 | 2 | 0 | 0 | 22 | 14 |
| Turkey | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 4 | 12 | 4 |
| Viet Nam | 3 | 3 | 29 | 20 | 61 | 19 | 0 | 0 | 93 | 42 |
| Total | 3 | 3 | 46 | 32 | 95 | 41 | 80 | 51 | 224 | 127 |

* Laboratory-confirmed avian influenza cases are report by the World Health Organization (WHO).

Appendix 1: MMWR Week

Please refer to the table below to interpret data presented by MMWR week.

| Week Ending | MMWR | Week Ending | MMWR |
|--------------------|-------------|--------------------|-------------|
| 10/8/05 | 40 | 4/8/06 | 14 |
| 10/15/05 | 41 | 4/15/06 | 15 |
| 10/22/05 | 42 | 4/22/06 | 16 |
| 10/29/05 | 43 | 4/29/06 | 17 |
| 11/5/05 | 44 | 5/6/06 | 18 |
| 11/12/05 | 45 | 5/13/06 | 19 |
| 11/19/05 | 46 | 5/20/06 | 20 |
| 11/26/05 | 47 | 5/27/06 | 21 |
| 12/3/05 | 48 | 6/3/06 | 22 |
| 12/10/05 | 49 | 6/10/06 | 23 |
| 12/17/05 | 50 | 6/17/06 | 24 |
| 12/24/05 | 51 | 6/24/06 | 25 |
| 12/31/05 | 52 | 7/1/06 | 26 |
| 1/7/06 | 1 | 7/8/06 | 27 |
| 1/14/06 | 2 | 7/15/06 | 28 |
| 1/21/06 | 3 | 7/22/06 | 29 |
| 1/28/06 | 4 | 7/29/06 | 30 |
| 2/4/06 | 5 | 8/5/06 | 31 |
| 2/11/06 | 6 | 8/12/06 | 32 |
| 2/18/06 | 7 | 8/19/06 | 33 |
| 2/25/06 | 8 | 8/26/06 | 34 |
| 3/5/06 | 9 | 9/2/06 | 35 |
| 3/11/06 | 10 | 9/9/06 | 36 |
| 3/18/06 | 11 | 9/16/06 | 37 |
| 3/25/06 | 12 | 9/23/06 | 38 |
| 4/1/06 | 13 | 9/30/06 | 39 |